

AMENDMENT TO THE CLAIMS

1 (currently amended). A method for manufacturing a monolithic piezoelectric ceramic actuator part which has a plurality of piezoelectric ceramic layers and spaced internal electrode layers disposed in said piezoelectric ceramic actuator part, wherein said piezoelectric ceramic making up said piezoelectric ceramic layers is formed of a perovskite compound oxide expressed by the general formula of ABO_3 , and comprises at least Pb for the A site component and comprises Ti or Ti and Zr for the B site component and said internal electrode layers contain Ag as a primary component; said method comprising:

providing a piezoelectric ceramic powdered raw material wherein the molar quantity of said A site component is reduced by about 0.5 mol% to 5.0 mol% from that of a stoichiometric composition and the average valence of said B site component of the ceramic raw material is greater than that of the stoichiometric composition and is greater than 4.000 and less than 4.100;

fabricating a layered article with said piezoelectric ceramic powdered raw material; and

sintering said layered article within an atmosphere wherein the oxygen concentration is about 5% by volume or less but more than 0% by volume.

2 - 3 (canceled).

4 (currently amended). A method for manufacturing a monolithic piezoelectric actuator part according to Claim 1, wherein the molar quantity of Pb included in said A site component has been reduced by about 0.5 mol% to 5.0 mol% from that of the stoichiometric composition.

5 (currently amended). A method for manufacturing a monolithic piezoelectric actuator part according to Claim 4, wherein said B site component further comprises Nb.

6 (currently amended). A method for manufacturing a monolithic piezoelectric actuator part according to Claim 4, wherein said B site component further comprises Nb and Ni.

7 (currently amended). A method for manufacturing a monolithic piezoelectric actuator part according to Claim 4, wherein said B site component further comprises at least one of Nb, Sb, Ta and W.

8 (currently amended). A method for manufacturing a monolithic piezoelectric actuator part according to Claim 7, wherein said B site component further comprises at least one of Ni, Cr, Co and Mg.

9 (currently amended). A method for manufacturing a monolithic piezoelectric actuator part according to Claim 8, wherein said layered article fabrication comprises a ceramic green sheet fabrication forming said piezoelectric ceramic powdered raw material into sheet form so as to fabricate a plurality of ceramic green sheets, forming an electrode pattern on at least two of said ceramic green sheets with an electroconductive paste for internal electrodes which contains Ag as a primary component, and layering a plurality of ceramic green sheets upon which said electrode patterns have been formed so as to form a layered article.

10 (canceled)

11 (currently amended). A method for manufacturing a monolithic piezoelectric actuator part according to Claim ~~9~~ 10, wherein said electroconductive paste contains Ag and Pd in a ratio of at least 70/30.

12 (currently amended). A method for manufacturing a monolithic piezoelectric actuator part according to Claim 11, wherein said electroconductive paste contains Ag and Pd in a ratio of at least 80/20 and the thickness of the ceramic layers is such that their thickness after sintering is about 64μm or less.

13 (currently amended). A method for manufacturing a monolithic piezoelectric actuator part according to Claim 12, wherein said electroconductive paste contains Ag and Pd in a ratio of at least 85/15 and the thickness of the ceramic layers is such that their thickness after sintering is about 40μm or less.

14 (currently amended). A method for manufacturing a monolithic piezoelectric part according to Claim 1, wherein said B site component ~~further~~ comprises Ti and Zr.

15 (currently amended). A method for manufacturing a monolithic piezoelectric actuator part according to Claim 1, wherein said B site component further comprises Nb.

16 (currently amended). A method for manufacturing a monolithic piezoelectric actuator part according to Claim 1, wherein said layered article fabrication comprises a ceramic green sheet fabrication forming said piezoelectric ceramic powdered raw material into sheet form so as to fabricate a plurality of ceramic green sheets, forming an electrode pattern on at least two of said ceramic green sheets with an electroconductive paste for internal electrodes which contains Ag as a primary component, and layering a plurality of ceramic green sheets upon which said electrode patterns have been formed so as to form a layered article.

17 -20 (canceled).

21 (currently amended) A method for manufacturing a monolithic piezoelectric actuator part according to Claim 1, wherein said B site component further comprises Nb and Ni.

22 (new). A method for manufacturing a monolithic piezoelectric ceramic audio emitter part which has a plurality of piezoelectric ceramic layers and spaced internal electrode layers disposed in said piezoelectric ceramic audio emitter part, wherein said piezoelectric ceramic making up said piezoelectric ceramic layers is formed of a perovskite compound oxide expressed by the general formula of ABO_3 , and comprises at least Pb for the A site component and comprises Ti or Ti and Zr for the B site component and said internal electrode layers contain Ag as a primary component; said method comprising:

providing a piezoelectric ceramic powdered raw material wherein the molar quantity of said A site component is reduced by about 0.5 mol% to 5.0 mol% from that of a stoichiometric composition and the average valence of said B site component of the ceramic raw material is greater than that of the stoichiometric composition and is greater than 4.000 and less than 4.100;

fabricating a layered article with said piezoelectric ceramic powdered raw material; and

sintering said layered article within an atmosphere wherein the oxygen concentration is about 5% by volume or less but more than 0% by volume.

23 (new). A method for manufacturing a monolithic piezoelectric ceramic audio emitter part according to Claim 22, wherein the molar quantity of Pb included in said A site component has been reduced by about 0.5 mol% to 5.0 mol% from that of the stoichiometric composition.

24 (new) A method for manufacturing a monolithic piezoelectric ceramic audio emitter part according to Claim 23, wherein said B site component further comprises Nb.

25 (new) A method for manufacturing a monolithic piezoelectric ceramic audio emitter part according to Claim 24, wherein said layered article fabrication comprises a ceramic green sheet fabrication forming said piezoelectric ceramic powdered raw material into sheet form so as to fabricate a plurality of ceramic green sheets, forming an electrode pattern on at least two of said ceramic green sheets with an electroconductive paste for internal electrodes which contains Ag as a primary component, and layering a plurality of ceramic green sheets upon which said electrode patterns have been formed so as to form a layered article.

26 (new). A method for manufacturing a monolithic piezoelectric ceramic audio emitter part according to Claim 25, wherein said electroconductive paste contains Ag and Pd in a ratio of at least 70/30.

27 (new). A method for manufacturing a monolithic piezoelectric ceramic audio emitter part according to Claim 22, wherein said electroconductive paste contains Ag and Pd in a ratio of at least 80/20 and the thickness of the ceramic layers is such that their thickness after sintering is about 64 μ m or less.